VOLUME IV:
Comprehensive Statewide E9-1-1 Telecommunications Plan

North Carolina 911 Board

intrado®

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prepared for

North Carolina 911 Board

January 6, 2009

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Contents

INTRODUCTION

The statewide 9-1-1 challenges facing North Carolina as well as the nation are aptly described in a recent study commissioned by the 9-1-1 Industry Alliance[1]:

> Our nation's emergency system is getting left behind by technological change. The original provision of 9-1-1 arose in a world where a single carrier… provided service to customers using analog voice connections from fixed locations. Today, by contrast, there are a multiplicity of providers, almost all of which use digital technology and many of which offer "nomadic" or mobile services. In response to technological innovation, our current 9-1-1 infrastructure is a clever but "jury-rigged" system that uses yesterday's technology to provide service in a world very different for which it was designed. Indeed, the limits of the legacy technology used in emergency communications can be best understood by viewing today's 9-1-1 system as an analog island in a digital sea. To be sure, the ingenuity of the engineers who have stretched the current system to accommodate wireless telephony and other services is admirable. But policymakers must recognize that the system is stressed to its limits and change is required.[2]

In response to NC G.S. 62A-42. (a)(1)[3], which specifies that the North Carolina 911 Board (the Board) has a duty to develop a 9-1-1 state plan, the Board engaged Intrado to investigate, document, and assess the current emergency communications infrastructure in North Carolina, report trends in the 9-1-1 and telecommunications industry, and make recommendations that will allow the Board to develop and execute a comprehensive Enhanced 9-1-1 telecommunications plan. This plan is a result of the contract between the Board and Intrado.

Taking into account the challenges discussed in the 9-1-1 Industry Alliance study, Intrado developed this *Comprehensive Statewide E9-1-1 Telecommunications Plan* (plan) to foster the development of a statewide inter-networked 9-1-1 system allowing for Enhanced 9-1-1 (E9-1-1) call information to be communicated across networks and between Public Safety Answering Points (PSAPs) in North Carolina.

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[1] The mission of the 9-1-1 Industry Alliance is to "represent the emergency communications industry in the development of emergency technology infrastructure and policy, for the good of public safety and the public it serves." See http://www.911alliance.org. Retrieved October 13, 2008.

[2] The 9-1-1 Industry Alliance 2008 Study on the Health of the United States Emergency Network: A Call to Action by the ColoComm Group, LLC. December 8, 2007.

[3] NC G.S. 62A-42.(a)(1) specifies that the North Carolina 911 Board has a duty to "develop the 911 State Plan. In developing and updating the plan, the 911 Board must monitor trends in voice communications service technology and in enhanced 911 service technology, investigate and incorporate GIS mapping and other resources into the plan, and formulate strategies for the efficient and effective delivery of enhanced 911 service." http://www.ncleg.net/enactedlegislation/statutes/html/bysection/chapter_62a/gs_62a-42.html. Retrieved October 9, 2008.

THE PLAN

Purpose and Scope of Study

In preparing its report, Intrado conducted interviews and collected information from North Carolina PSAPs as well as other entities that interact with 9-1-1 call flow, analyzed the findings, assessed industry trends, and developed the recommendations according to a short term (3 year) and long term (5 year and more) plan. The recommendations represent actions intended to address each of the 9-1-1 system areas assessed in the course of the project.

FINDINGS AND RECOMMENDATIONS

Understand the actual costs for providing 9-1-1 service in North Carolina

Finding:

Board staff currently collects 9-1-1 expense information from counties. For this assessment, PSAPs were asked to provide various 9-1-1 costs, and in many cases, PSAPs provided actual bills or budget documents to substantiate their costs. In addition, Intrado developed a baseline cost model as part of this assessment. It calculates the going-forward cost for 9-1-1 based on county populations, tariffs, and estimated costs for 9-1-1 system components. The going-forward costs represent the cost liability the 9-1-1 fund may need to bear as the actual costs change over the short and long term.

Recommendation:

Intrado recommends that the Board staff continually collect information from North Carolina PSAPs with which to forecast the cost for providing 9-1-1 service. The costs that are currently collected represent the historical costs PSAPs have incurred and may not accurately reflect all of the going-forward costs that will be incurred as 9-1-1 systems need to be replaced or upgraded. As counties and PSAPs submit their actual costs, the Board staff should update the model to continually reflect the new information. Other impacts to actual costs may occur as PSAPs purchase from the proposed statewide 9-1-1 catalog, realize that additional items are allowed, utilize newly offered common/shared resources, or implement next generation 9-1-1 technology.

Implement Strategic Planning Process

Finding:

Intrado's plan represents a 'point in time' analysis and plan for the Board to help coordinate activities to be performed by multiple parties throughout the state. By necessity, subsequent actions will need to be identified and taken based on the results of these initial recommendations.

Recommendation:

Intrado recommends that the Board implement an ongoing strategic planning process. As further described in this plan, this process would:

- Assess the current operational measures collected as part of this study (augmented with additional data collection or data validation as specified below) and the going-forward cost for providing 9-1-1 service in North Carolina;
- Determine whether the current operational measures and existing 9-1-1 funding is optimally aligned with statewide 9-1-1 system goals and going-forward costs;
- Investigate opportunities to gain efficiencies, leverage common resources, and implement new capabilities including next generation 9-1-1 technology;

- As necessary, propose system improvements, reconfigurations, or new funding models that more closely align system goals and the going-forward costs to provide 9-1-1 service.

Finding:

The North Carolina 9-1-1 system consists of diverse facilities, equipment, network, and software components. Prior to this assessment, there was no single or comprehensive source describing all of the various components statewide. The Board will require accurate and timely information regarding North Carolina 9-1-1 systems in order to plan for its ongoing development and funding, as well as assess the state's progress in migrating to Next Generation 9-1-1.

Recommendation:

Intrado recommends that the Board establish a process for PSAPs to continually submit, update, and validate 9-1-1 system information so the Board always has a reasonably accurate view of current 9-1-1 deployments. In the short-term, this process can be built upon the PSAP survey that was performed in support of the development of this plan. In the long-term, the Board staff should work with the North Carolina Office of Information Technology Services to augment the 911 Board web site by creating a repository and secure methods for PSAPs to maintain their information online. This will facilitate the updating of information by the PSAPs as well as provide management reports and data query capabilities to the Board.

Finding:

In the course of this assessment, it was observed that North Carolina county 9-1-1 system components are continually changing as PSAPs, carriers, and vendors upgrade or modify their services and configurations. The assessment performed in support of this plan provides a "snapshot" in time of the current system configurations for each county. A statewide inventory of 9-1-1 systems quickly becomes obsolete if not maintained and kept in alignment with those changes as they occur.

Recommendation:

The Board should specify a schedule for PSAPs to update or validate their data. Ideally, data updates would occur whenever there is a significant change in a county's 9-1-1 system, but not less than twice per year. In addition, as next generation systems are implemented, new data requirements corresponding to next generation equipment types and information categories will be identified. These new data requirements should be added to the data collection process.

Finding:

During the PSAP survey process, some North Carolina PSAPs indicated they do not routinely collect certain operating statistics that were requested by the Board such as 9-1-1 call volumes and dispatch intervals. Other PSAPs indicated they do not know how to extract the statistics from their call taking and dispatch systems.

Recommendation:

Intrado recommends that the Board communicate the need for PSAPs to work with their vendors to implement management information system (MIS) reporting capabilities, or understand how to use existing tools, in order to respond to requests for 9-1-1 call

statistics from the Board and be able to participate in the data collections process outlined above.

Finding:

According to Intrado's research and interviews performed in support of this study, communication services are now broader than phone calls over a standard telephone instrument. They are voice and text, wired and wireless, and are being delivered in a multi-tiered, multi-vendor market structure. There are retail providers and wholesale providers of communication service and infrastructure. And the evolution of IP-enabled communications service is changing the way people communicate with each other. From the perspective of the general public, the transition to next generation communications technologies has been underway for years. Although some of these technologies have been integrated into the existing 9-1-1 network through various means, the solutions are neither complete nor able to offer the level of functionality expected by the public. Because the existing 9-1-1 network is based solely on voice delivery, integration of new technologies like text messaging, telematics, data services, and images is not possible.

Recommendation:

Migration to Next Generation 9-1-1 technology is not only essential to provide citizens of North Carolina with complete integration of their existing communications means, but also provides a forward-looking, progressive path for integrating new technologies as they become adopted by the public. This will entail making sure current infrastructure truly meets existing needs for the short term, investigating and assessing new 9-1-1 service platforms, developing migration strategies, and executing them effectively to assure there is no degradation of services. Intrado recommends the Board take an aggressive role to lead, coordinate, and facilitate these activities across the 100 counties.

Understand the design of existing North Carolina 9-1-1 systems

Finding:

Intrado's report indicates that the number of PSAP positions per capita per county varies markedly across the state, as do certain other measures and operating statistics, even when controlled for population differences. Many of these variances are identified in Volume I; Section 3.2 of the report.

Recommendation:

Intrado recommends that the Board work with PSAPs to understand the cause for the variability of certain measures and operating statistics as identified in the report. In many cases, there may be local factors that reasonably contribute to the differences. In other cases, counties may recognize an opportunity for regionalizing 9-1-1 service to increase efficiency or jointly implement next generation system capabilities. The proposed ongoing collection of statewide 9-1-1 data can support the development of "what-if" scenarios or ad hoc business cases for estimating potential benefits associated with regionalizing service in different configurations.

Establish a consistent and comprehensive training curriculum

Finding:

As indicated by the PSAP surveys, the amount and type of new and ongoing call-taker and dispatcher training varies from location to location throughout North Carolina. A standard curriculum has been adopted by the North Carolina Sheriffs' Association for the training of sheriff department personnel.

Recommendation:

Intrado recommends that all PSAPs adopt a consistent and comprehensive minimum training curriculum for 9-1-1 call takers and dispatchers. Leveraging the North Carolina Sheriffs' Association call-taker training, PSAP managers should ensure that the scope of training represents a minimum recommended 9-1-1 curriculum as specified by standards bodies and associations such as APCO, NENA, and CALEA[4].

Design, Implement and maintain a statewide 9-1-1 GIS/Mapping system and database

Finding:

According to PSAP survey results, North Carolina counties and PSAPs maintain discrete geographic information systems (GIS). As a result, data collection, validation, maintenance, and storage are conducted by each county. The availability of North Carolina county GIS resources varies, as does the software employed, sources of information, and scheduling and method for updates. Volume I, Section 5 of this report provides a detailed assessment of the current use of GIS by PSAPs, as well as an inventory of North Carolina GIS resources.

Recommendation:

Intrado recommends that the Board Staff designate a program manager responsible for tasks specifically associated with assessing options for implementing a centralized statewide GIS database based on the conceptual architecture presented in the report. Tasks would include the issuance of requests for information and proposals for implementing the hardware, network, software, and procedures for establishing and maintaining a statewide GIS resource. To augment this capability and leverage existing resources, the program manager should represent 9-1-1 stakeholders in statewide GIS initiatives such as NC OneMap.

Develop and maintain a centralized state repository for information about 9-1-1 and the communications industry

Finding:

Rapid changes in communications technology, a shifting regulatory climate, and national efforts to deploy next generation 9-1-1 systems is creating large amounts of information

[4] The Communications Assistance for Law Enforcement Act of 1994.

regarding the public safety environment. The North Carolina 911 Board web site can be an effective method for sharing information with PSAPs. Almost every North Carolina PSAP indicated that they currently have internet access.

Recommendation:

Intrado recommends that the Board continue and expand use of the 911 Board web site as a centralized repository for ancillary information about 9-1-1 and the communications industry. Working with the North Carolina Office of Information Technology Services, Board staff can maintain a "public library" that would allow the Board, PSAPs, and 9-1-1 professionals to post documents and create links to various industry forums and standards bodies such as NENA, APCO, and Emergency Services Interface Forum (ESIF). The sharing of such resources will most likely become even more crucial as features for next generation 9-1-1 systems are defined and standards evolve.

Finding:

As part of its assessment, Intrado identified that the technical standards for next generation 9-1-1 systems are still evolving in standards bodies such as the Emergency Services Interconnection Forum and various NENA technical subcommittees. In its report, Intrado identified various reference models for NG9-1-1 that are being promoted by government as well as public and private entities.

Recommendation:

Intrado recommends that the migration to next generation 9-1-1 systems in North Carolina follow guidelines so that the easy inter-operation of 9-1-1 systems is assured. The Board should monitor PSAP trials of next generation 9-1-1 technologies (both within North Carolina and elsewhere), compile information, and assemble "lessons learned" to facilitate the propagation of approaches that are deemed successful and the efficient application of replicable processes. In addition, the Board's statewide knowledge of 9-1-1 systems can provide the North Carolina Utilities Commission with a valuable resource to establish service standards for next generation 9-1-1 systems that more readily accommodate IP-based technologies such as Telecommunications Relay Service (TRS), Video Relay Service (VRS), text messaging, and video.

Provide 9-1-1 technical and operational expertise and project management assistance

Finding:

There is an ongoing need at the PSAP and local-government level for 9-1-1 technical and operational expertise, as well as project management. This was made evident by PSAPs reporting that some systems did not work properly or at all, that some PSAPs could not access information from their systems, and that some equipment vendors were not responsive to repeated requests for assistance. Project management for upgrade to systems is conducted largely on a standalone county and PSAP basis.

Recommendation:

Intrado recommends that additional technical expertise be made available to PSAPs that may not have their own experts. Project plan templates and checklists for tasks should be developed for replicable activities to ensure that all issues are addressed. PSAPs

should be encouraged to share 'lessons learned' and identify instances where vendors are not responsive or systems do not work as expected. Specific attention will be required to coordinate tasks with neighboring PSAPs who may have inter-local agreements.

Finding:

Some PSAP representatives are not knowledgeable regarding the network configurations implemented by their 9-1-1 service providers and therefore were not able to provide specific information to the Board regarding abilities or constraints to transfer 9-1-1 calls.

Recommendation:

Intrado recommends that the Board communicate the need for there to be a coordinated effort between the PSAPs, LECs, and 9-1-1 service providers to validate or update the information representing each county's 9-1-1 system configuration including trunks, selective routers, and ALI database, as well as the PSAPs' ability to transfer 9-1-1 calls with data. When validated and kept current, such information can provide the Board with additional insight into jurisdictional border areas that may be experiencing chronic misroutes and explain why some North Carolina counties can transfer 9-1-1 calls with ANI/ALI and 9-1-1 call priority to certain counties while others cannot.

Align 9-1-1 funding across communications providers and cover all 9-1-1 systems expense items

Finding:

County 9-1-1 systems are funded from statewide 9-1-1 revenues at a "locked in" rate. The current method for allocating 9-1-1 funds to counties in North Carolina is based on a historic level that may not accurately represent future funding requirements. Many 9-1-1 components have a fixed lifespan after which they must be replaced. The need to implement new systems (including next generation 9-1-1), population growth and demographic shifts, as well as inflation may impact future costs. Additionally, there is an ongoing nation-wide trend for consumers to consolidate their telecommunication services which is resulting in a decrease in overall 9-1-1 revenues.

Recommendation:

Intrado recommends that the Board continually assess whether existing 9-1-1 funding and revenue allocation is appropriate to support the statewide 9-1-1 system and to meet the expenses associated with cost recovery for PSAPs, wireless carriers, and communication service providers while simultaneously planning for growth and enhancements.

Assess and correct PSAP space and environmental deficiencies to meet minimal requirements for the transition to NG9-1-1

Finding:

According to PSAP survey results, and as observed and documented during onsite PSAP visits, some PSAP facilities have deficiencies for housing and operating current 9-1-1 communications equipment or will be deficient for housing and operating next

generation 9-1-1 equipment. Deficiencies were noted in environmental conditions, wiring, and space. In general, the PSAPs were aware that such deficiencies existed. Although the onsite assessment was not intended to expertly assess all building systems, both notes and photographs were recorded where older structures or specific areas of PSAP facilities may be inadequate to appropriately house and operate the type of equipment necessary to implement next generation technology.

Recommendation:

Intrado recommends that the Board communicate the need for counties and PSAPs to address space, wiring, and environmental deficiencies. A compilation of equipment vendor environment, power, and space requirements provides a baseline set of recommended guidelines that should be adhered to by all PSAPs. Failure to address such issues may degrade system performance or cause systems to fail, invalidate system warrantees, and increase operating expenses

Establish inter-selective router transfer capabilities and ALI database node interoperability

Finding:

As described in detail in Volume I; Section 4 of the report, some PSAPS are unable to transfer emergency calls with ANI to other PSAPs in their surrounding areas. The caller's identifier, the ANI, must be sent with the voice path over the PSAP emergency trunks to the second (transferred-to) PSAP to enable that PSAP to retrieve an ALI record for the caller[5]. Challenges that prohibit the ability to transfer an emergency call with ANI include:

- PSAP's served by different service provider's selective routers
- PSAPs served by same 9-1-1 service provider but different selective routers

Without the activation of special software on the selective router, inter-selective router transferred calls will include the PSAP's phone number instead of the caller's ANI as the caller identifier in the voice path. This prohibits the PSAP receiving the transferred call from receiving the caller's ANI as part of the incoming call and thus the PSAP is unable to retrieve the ALI record.

The E9-1-1 Tandem-to-Tandem feature is a software package that enables the ANI, instead of the PSAP phone number, to be preserved and presented with the transferred call as part of the voice call. The feature package is currently available on all the DMS switches acting as selective routers serving North Carolina. Use of this feature requires that the 9-1-1 service provider purchase the right-to-use license from Nortel and then activate the software on the selective router.

Recommendation:

Intrado recommends:

- The Board should request the ongoing periodic submission of inter-selective router call transfer statistics from all primary PSAPs to include the volumes and

[5] To maintain the status of an emergency call, the transferred call must come in over the PSAP emergency trunks, the same trunks used for 9-1-1 calls.

types of calls transferred between PSAPs: wireline, wireless, VoIP (see 9-1-1 System Data Collection).

- Based on its evaluation of the PSAP call transfer statistics, the Board should assess the need for additional inter-selective router trunks to support transfers and prioritize which selective router switches may require activation of the E9-1-1 Tandem-to-Tandem feature based on a higher volume of transferred calls.
- The Board should request from 9-1-1 service providers price quotations and ordering procedures for activation of the E9-1-1 Tandem-to-Tandem feature including any implementation considerations or constraints.
- Focusing initially on counties where call statistics indicate a high volume of transferred calls, the Board should share the information with PSAPs and governing authorities regarding availability of the E9-1-1 Tandem-to-Tandem feature, benefits, ordering procedures, and any implementation considerations or constraints so that PSAPs can assess the information and follow up with their 9-1-1 service provider.
- The Board should establish a method to pay for use of the E9-1-1 Tandem-to-Tandem feature. As a common resource that by definition will be used by multiple counties and PSAPs to provide E9-1-1 service throughout the state, and in order to encourage efficient implementation statewide, Intrado recommends the Board pay for use of the feature from 9-1-1 funds.
- Based on the ongoing evaluation of PSAP call transfer statistics, the Board should continually assess the need for additional selective routers to have the E9-1-1 Tandem-to-Tandem feature activated and/or additional inter-selective router trunks.
- The Board should continue to identify candidate PSAPs and selective router switches (those with progressively lower volumes of transferred calls) that would still benefit from activation of the E9-1-1 Tandem-to-Tandem feature for call transfers.

Deploy a centralized ALI database

Finding:

North Carolina PSAPs are served by multiple 9-1-1 service providers: AT&T, Embarq, Verizon, Citizens Telephone, and Windstream. AT&T and Embarq have regional ALI databases for wireline and wireless ALI records. Verizon is in the process of establishing a regional database for wireless ALI record access for PSAPs in their service areas. The current deployment of multiple ALI database nodes in North Carolina precludes delivery of ALI subscriber data records between 9-1-1 service providers when 9-1-1 calls are transferred.

Recommendation:

Intrado recommends:

- The Board Staff should designate a program manager responsible for tasks specifically associated with assessing options for resolving the ALI database

challenges including potential implementation of a centralized statewide ALI database as well as common data format (see below).

- Acting on behalf of the Board, the program manager should issue a request for information (RFI) to solicit input regarding potential benefits, implementation options, estimated costs, and policy issues associated with establishing a centralized statewide ALI database. The results of the RFI will provide the Board with potential design and implementation options for providing a centralized statewide ALI database.

Finding:

A second challenge for delivering consistent data for transferred calls arises from the fact that North Carolina PSAPs utilize different data formats. This is not a problem when PSAPs operate independent of each other utilizing standalone ALI (SALI) systems. However, in order to be able to transfer calls and share data, the data format issue needs to be addressed so that the call information is displayed appropriately for each PSAP.

Recommendation:

Intrado recommends:

- The Board should appoint a task force consisting of PSAP representatives, 9-1-1 service providers, the ALI database program manager, and other interested North Carolina 9-1-1 stakeholders to determine the benefits, costs, and procedures necessary for PSAPs to agree on a standard ALI data format with a focus on supporting converged technology – wireless, VoIP. The task force should consider the experience of other states that have standardized their ALI record formats. California is an example of a state where standard formats have been agreed upon for all PSAPs and used for access to wireless records.

Develop a statewide procurement process and catalog of 9-1-1 services and equipment

Finding:

Currently, procurement of 9-1-1 products and services in North Carolina is executed largely on an individual county and PSAP basis. Duplicate requests for proposal (RFP) processes are conducted and different terms and conditions are negotiated by each agency.

Recommendation:

Intrado recommends that the Board establish a voluntary statewide procurement process and compile a catalog of 9-1-1 services and equipment. This would relieve local governments of the need to conduct individual competitive bids, while assuring them of quality products and services that meet basic technical, operational, and interoperability requirements. As demonstrated by other states that have established 9-1-1 catalogs, the use of “bulk” purchasing should reduce costs and help stretch public safety dollars.

Develop 9-1-1 operational and technical requirements for Multi Line Telephone Services (MLTS)

Finding:

Currently, North Carolina does not have legislation requiring 9-1-1 for users of Multi Line Telephone Service (MLTS). As discussed in Volume I; Section 6 of the report, MLTS creates unique issues for enhanced 9-1-1 systems due to challenges in delivering the calling parties' telephone number and specific location for 9-1-1 calls made within a business or residential tenant facility. This information is critical when attempting to locate callers who are unable to provide accurate location information. The lack of specific location information can have dire consequences if the caller is disconnected, because there is no call back number to reach the person who placed the call.

Considering the growth of VoIP-type multiline telephone systems for businesses and the mobility these systems provide for "soft phone"[6] users, plus the integration of wireless calling devices with MLTS systems, public safety services have a growing dependency on states to provide legislative directives for businesses to implement MLTS E9-1-1 solutions.

Recommendation:

Intrado recommends that the Board communicate to the North Carolina legislature the need for MLTS 9-1-1 legislation to cover businesses and residential tenant facilities. Furthermore, the Board should encourage North Carolina state and local governments to lead by example and implement MLTS 9-1-1 for all agencies currently not covered by such service. This is especially crucial for North Carolina university campuses that provide telephone services for residential housing facilities for students.

The current status of MLTS rules is discussed in detail in Volume I; Section 6.1.7 of the report regarding federal regulatory mandates. A copy of NENA's sample MLTS legislation is included in Appendix Q.

Research, evaluate, and coordinate deployment of applications to be integrated into NG9-1-1

Finding:

Current 9-1-1 network and equipment and associated PSAP operations are designed to be discretely provisioned for or conducted by each PSAP. A recurring theme addressed in the report is the benefit associated with greater integration, inter-operation, and sharing of resources, much of which will be made possible by next generation technology. Many NG9-1-1 systems will be IP-based and will have the ability to support other applications on data networks that can serve multiple purposes for public safety.

[6] The term "soft phone" generally refers to a software program for making telephone calls over an IP network like the Internet or a private managed IP network using a computer instead of a dedicated telephone instrument. A soft phone is often designed to look like a standard telephone and has buttons that represent the standard functions that are often found on telephone sets.

Recommendation:

With the advent and deployment of this new technology, there will be a need to research and evaluate these applications and to coordinate deployment across systems statewide. For example, a single data network could hypothetically be used for Radio over IP (RoIP) applications that resolve inter-jurisdictional radio interoperability issues, emergency event management, E9-1-1 call delivery, and access to centralized GIS resources.

Finding:

According to survey results, 97 North Carolina PSAPS currently have access to a citizen notification "call-out" system while 64 indicated that they would be interested in having such a capability. In North Carolina, the Emergency Management Division of the North Carolina Department of Crime Control and Public Safety[7] is the central organization for Emergency Alerting Systems. Currently there are several methods for outbound emergency notification and various systems to support them including:

- Emergency Alert System (EAS)—Standard method used to disseminate information via television and radio media broadcasters to the public.
- Call-Out Phone Systems—Calling home phones to alert residences in particular areas
- Text Message (Short Message Service (SMS)—Useful for notification on college campuses and relaying brief information about an emergency
- Broadcast Email—Requires email lists to alert individuals with email access
- Siren Systems—Community-wide notification of impending emergency situations. Some systems include voice audible explaining the type of emergency along with the siren.
- Web Sites—Posting of emergency situations on web sites to allow global communication
- Instant Messaging—Another means of sending messages within a designated group of recipients
- Electronic Billboards—Posting of emergency situations on highways, evacuation routes, etc.

None of these emergency notification systems interface directly with the physical 9-1-1 system. The only emergency notification system that may have an operational relationship to the 9-1-1 system is an outbound notification phone system. Outbound call notification systems often utilize standard directory white page listing information, but this information may be inadequate for emergency notifications. Standard white page listing data does not include non-published numbers or many business non-listed numbers, thereby not fully representing the contact area.

[7] NC Department of Crime Control & Public Safety: http://www.nccrimecontrol.org. Retrieved September 10, 2008.

Recommendation:

Intrado recommends that the Board encourage PSAPs and Emergency Management to adopt a consistent set of guidelines if they choose to use ALI database data as part of their emergency call-out systems. Using the 9-1-1 database to support emergency call-out systems would ensure that all numbers in a target area are available for notification messages. A common set of guidelines would control the use and access to the data for this purpose. Additionally, authorized agencies could negotiate a common set of terms and conditions with service providers for use of the data.

Improve Wireless E9-1-1 Confidence and Uncertainty Factors

Finding:

Confidence and Uncertainty are numeric representations that may be provided along with the latitude and longitude (x,y) coordinates associated with a Phase II wireless E9-1-1 call. The NENA master glossary defines the two terms as follows:

- Confidence—Mathematically derived statistical estimate indicating how sure the measuring system is that the wireless Phase II location data estimate is accurate, within the bounds defined by the Uncertainty value. This is expressed as a percentage, such as 90% or 45%, etc. The specific value is not representative of the accuracy of the Position Determining Entity (PDE).
- Uncertainty—Mathematically derived statistical estimate, expressed in meters, indicating the size of the area used in the calculation of the Confidence. The specific value is not representative of the accuracy of the PDE location system.

FCC requirements for wireless Phase II E9-1-1 calls (FCC Docket Number 94-102) state that the wireless carriers provide longitude and latitude within certain accuracy requirements. However, federal requirements for Phase II location data do not mandate the delivery of confidence and uncertainty data. These supplemental data fields are most useful when the PSAP displays the longitude and latitude coordinates as a point on a map. The confidence and uncertainty data can be used in an algorithm in the mapping software to produce a visual representation of the probable range of location of an emergency call.

When surveyed, many North Carolina PSAPs indicated that they either do not receive confidence and uncertainty information with the latitude and longitude, or do not believe it is reliable, or do not know how to use it appropriately.

Recommendation:

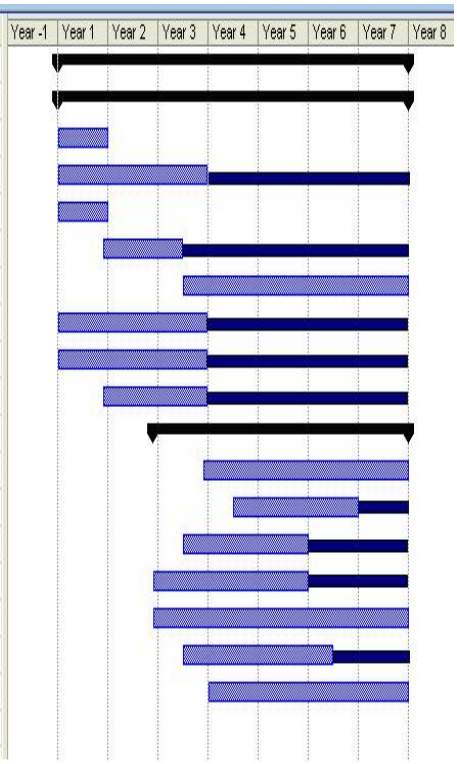
Intrado recommends that the Board share with agencies the need for PSAPs to work collaboratively with wireless carriers to do regular and random field testing of wireless 9-1-1 calls. The purpose of this collaborative testing is to help PSAPs assure the quality of information being presented to call takers. The field testing of wireless carrier location accuracy for mapping validation requires that the PSAPs have access to GPS units and wireless services from the wireless carriers in their area. Some wireless carriers provide service and handsets at no charge to the PSAP testing personnel. Alternately, Intrado recommends that such equipment be an allowable expense under Board guidelines. Additionally, PSAPs will need to dedicate trained personnel to the task. Appropriate training regarding mapping software, GIS, wireless 9-1-1 call routing, and the

appropriate use of confidence and uncertainty information should be funded under current guidelines.

Given these requirements and the replicable nature of this testing, the Board (or a contracted 3rd party) may be better positioned to administer the logistics of wireless field testing for mapping validation on behalf of North Carolina PSAPs. There would be certain economies of scale and a concentration of expertise if a single party performed regular and random testing on behalf of PSAPs throughout the state.

PROPOSED PROJECT PLAN

	Task Name
1	**Comprehensive Statewide 9-1-1 Plan**
2	**Three-Year Plan**
3	Understand the actual costs for providing 9-1-1 service
4	Implement Strategic Planning Process
5	Understand the design of existing North Carolina 9-1-1 systems
6	Establish a consistent and comprehensive training curriculum
7	Design, implement and maintain a statewide 9-1-1 GIS/Mapping system and database
8	Develop centralized 9-1-1 information repository
9	Provide 9-1-1 technical and project management assistance
10	Improve Wireless E9-1-1 Confidence and Uncertainty Factors
11	**Five Plus Year Plan**
12	Align 9-1-1 funding
13	Assess and correct PSAP deficiencies for transition to NG9-1-1
14	Establish inter-selective router transfer and ALI database interoperability
15	Deploy a centralized ALI database
16	Develop a statewide procurement process and 9-1-1 catalog
17	Develop 9-1-1 for Multi Line Telephone Services (MLTS)
18	Coordinate deployment of applications to be integrated into NG9-1-1

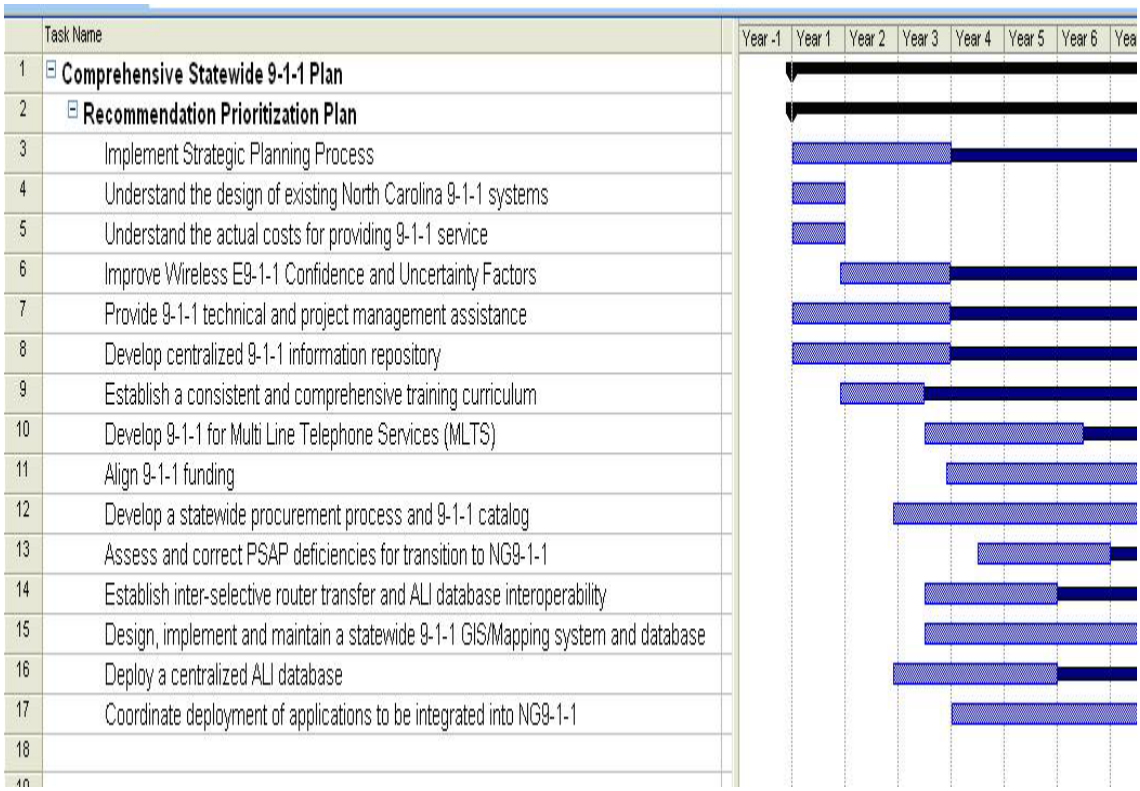


PRIORITIZATION OF RECOMMENDATIONS

The following table represents another view of the recommendations detailed above, listing them in order according to priority for improving 9-1-1 services in North Carolina.

Recommendation Prioritization Plan
1. Implement Strategic Planning Process
2. Understand the design of existing North Carolina 9-1-1 systems
3. Understand the actual costs for providing 9-1-1 service
4. Improve Wireless E9-1-1 Confidence and Uncertainty Factors
5. Provide 9-1-1 technical and project management assistance
6. Develop centralized 9-1-1 information repository
7. Establish a consistent and comprehensive training curriculum
8. Develop 9-1-1 for Multi Line Telephone Services (MLTS)
9. Align 9-1-1 funding
10. Develop a statewide procurement process and 9-1-1 catalog
11. Assess and correct PSAP deficiencies for transition to NG9-1-1
12. Establish inter-selective router transfer and ALI database interoperability
13. Develop, implement, and maintain a statewide 9-1-1 GIS/Mapping system and database
14. Deploy a centralized ALI database
15. Coordinate deployment of applications to be integrated into NG9-1-1

PRIORITIZATION PROJECT PLAN



RESOURCES TO IMPLEMENT THE PLAN

Intrado recognizes that implementation of all of the recommendations included in this plan would stretch the 9-1-1 Board Staff. Therefore, recommended incremental staffing needs for accomplishing the plan are as follows.

- Research for Centralized ALI Database (1 FTE)—This is an initial one-time task (12 months) to lead a taskforce, issue an RFI, and coordinate interested stakeholders in researching issues associated with the potential design and implementation of a centralized ALI database and agreement on a common data format. This task may spawn subsequent project design, implementation, and deployment phases which would require ongoing support of the resource.
- 9-1-1 Information Repository—Development and maintenance of 9-1-1 information repository (.25 FTE). Ongoing task to develop, acquire, research, and maintain the documents and information that will be made available related to the design, implementation, and operations of 9-1-1 services.
- 9-1-1 Network Configuration—Development and maintenance of 9-1-1 network schematics. A one time task to develop and publish the initial network schematics and then provide updates as changes in 9-1-1 systems occur. This could be performed by the same FTE required for the information repository as defined above.
- 9-1-1 Training Curriculum Development (1 FTE)—Create an ongoing project to research, develop, and publish 9-1-1 training curriculum. Project should include the coordination of training programs with other stakeholders and the various 9-1-1 agencies.
- Research for GIS and Mapping (1 temporary FTE)—This is a one-time task that could take 8-12 months to research, develop, and provide initial coordination of GIS systems and data in support of 9-1-1 systems and mapping. Should the state determine to continue with the mapping project and provide ongoing GIS and mapping support services, the position would require a permanent FTE.